"One of the clearest units of time in the minds of the people of Ifalik seems to be the rag. A rag is a period of five months. There are two of them, seu e vang and seu rag (or simply vang and rag), which alternate. In giving the list of month names, the chiefs put the first five in vang; the sixth 'in between'; the next five in rag; and the twelfth again, in between.

This corresponds fairly well to one of the most striking features of their climate, the seasons; so that rag might be translated 'season.' The people are quite clear on several characteristics of each rag. The first is the difference in direction of the prevailing wind. During vang the prevailing wind is from the east. During rag it is from the west, though less steadily. The second difference is in the supply of breadfruit. During vang there is very little breadfruit; during rag, there is plenty. A third difference is that one of the important methods of fishing is seasonal. Vang is the time for going out after flying fish (mèngor) on moonless nights, with torches of dried coconut leaf and dip-nets. During rag this kind of fishing is not practised. A fourth, lesser difference is that when there is breadfruit, they say, there are no golden plover (kulohg). When the breadfruit disappears, the plover arrive.

Native month names do not correspond exactly to those of our calendar, and we have no names for their seasons. But the seasons can be distinguished clearly enough in our terminology. The summary below was made by comparing notes taken during our stay on Ifalik with 'A Climatic Summary of the Caroline Islands', issued in 1944 by the

Aerology Section of the Navy.

Vang is the season of northern-hemisphere trade winds, which blow from the east or a little north of east. It corresponds to the winter of more northerly latitudes. The easterly winds set in, light and fitful at first, about November. In 1947 they did not become established until nearly the end of that month, but the season was said to be rather late that year. The trade wind blows more and more steadily through December, and in January and February there are comparatively few [10] calms. It builds up during the day, reaching a maximum in early afternoon and dying down again in the evening. It is generally light, up to 12 miles per hour, rarely more than 18. Beginning about March it is more and more often interrupted by calms.

Rag is the season of calms and variable, prevailingly west winds. Commander Betts explained that these westerly winds are actually the southern-hemisphere trade winds, which reach this latitude when the sun is farthest north. Blowing from the east to southeast quarter in more southerly latitudes, they swing clockwise to the southwest of the Carolines and so reach this area from the west.

Temperature varies little from season to season. It is usually within five degrees of 80° Fahrenheit. The variation between day and night--10 degrees or so--is greater than that between seasons. Clouds often cover the sky and reduce insolation. Effective temperature, measured by rate of evaporation, is also lowered much of the time by

breeze. Only bright, still days feel oppressively hot even to Americans. The natives seem to enjoy these, but are then inclined, even more than ever, to sit in the shade.

Rainfall is heavy. The nearest island for which records are available, Lamotrek, had a mean annual precipitation of 104.6 inches during the four years covered by the record. The season of calms and westerly winds, (April to August), is the rainiest, averaging more than 10 inches a month. As a rule, September, October, and November are relatively dry; December and January a little rainier; February the driest month of the year (mean precipitation on Lamotrek 2.1 inches), and March the next driest. However, rainfall may be heavy at any time. On Lamotrek, every month except February and September had more than 10 inches of rain during at least one of the four years of record.

Humidity is also steadily high, though somewhat less so during the season of easterly trade wind. It is disconcerting at first to see the apparently reckless handling of lighted bits of punk, rope, coconut husk, etc., in houses whose floors and roofs are covered with dried coconut leaf. Yet everything is so damp that accidental fires are rare; I saw but one during six months. For the same reason, cooking fires, though made of such light fuel as dried leaves and coconut husks, do not blaze high. They are smudgy so much of the time that most of the cooked food has a smoky taste."

1: Burrows--11 (1947-48) Woleaians
116, 132 Ifalik

"Four middle-aged men, asked how many typhoons they remembered, talked the matter over and reported a total of six. Only one of these was so severe that seas washed over the island. The inundation lasted for about two hours, they thought. The people all gathered in and around a house back from the shore. A rope was thrown around them, and all clung to it. Some did not manage to reach this place, and were washed away. All the breadfruit trees, they said, were blown down, most of the coconut trees, and the taro was washed out or destroyed. They remembered hearing of two particularly bad typhoons before their time. Sarfert's list of early chiefs includes mention of four memorable typhoons in the past. A resident of Ifalik, then, must expect to experience a number of typhoons during his lifetime; and one or more of them will probably endanger the lives of the population."

"In spite of magic, during the latter part of the west-wind season and sometimes the early part of the trade-wind season, wind sets in too strongly from the west, uprooting trees and taking the thatch off houses. At worst, it develops into a typhoon. A bad one sends waves clear over the island, carries away houses, and, what is worst, destroys food-bearing plants."

"A glimpse of the extent of interisland voyaging is afforded by the list of sailings to and from Ifalik during our six months there:

Aug. 18. --A visiting canoe from Faraulep, which had been at Ifalik since our arrival (July 28), awaiting a wind from the south, set out for home, accompanied by an Ifalik canoe.
Sept. 2. --Ifalik canoe returned from Faraulep.
Sept. 11. --An Ifalik canoe set out for Woleai.
Sept. 17. --Ifalik canoe returned from Woleai, accompanied by a Woleai canoe.
Sept. 19. --Woleai canoe returned.
Oct. 3. --Another canoe arrived from Woleai.
Oct. 11. --Visiting canoe went back to Woleai.
Dec. 6. --Ifalik canoe went fishing to the reef Faiaulap.
Jan. 14. --Woleai canoe that had visited Ifalik in October came again.

The long interval from Oct. 11 to January 14, with no sailings except one overnight fishing trip, was partly accidental, but largely due to the prevailing winds. During October and November they varied in both direction and force. They were mainly from the west. A west wind is good for reaching Elato, Lamotrek or Satawal from Ifalik.

But Tom was the only one who wanted to go that way (to visit a son on Lamotrek). And he was kept at home by two considerations: first, he had the visiting anthropologists to look after; second, his new canoe was not finished. [65]

Another deterrent at that time of year is that the westerly wind may blow up, with little warning, into a typhoon. Ifalik was not struck by a typhoon at that time; but twice --once in November, once in December-- was in the edges of one whose full force was felt on Yap. On those days the wind blew hard enough to uproot trees. That is far too strong for a canoe to venture out in, though one caught in such a blow may menage to ride it out.

From late November on, the trade wind blew from the east nearly every day. During the early part of its season this wind, too, is often too strong for safe sailing. Later on it dies down, and is more often a mild sailing breeze. Moreover, beginning about May, there would be occasional days of west wind; so that a canoe that went to Woleai before the trade might expect a good wind for the return trip without too long a wait. (A similar situation accounts for the frequent sailings to and from Woleai during September and October.) More frequent sailings might be expected during our spring and early summer months; but as we left Ifalik before then, no record can be given."

1: Burrows--80 (1947-48) Woleaians
116, 821, 132, 502 Ifalik

"Stars as Weather Signs

Stars are used not only to give directions, but to indicate weather. Only a few of these signs were given. They may have some validity for seasonal changes. When the star Maileu (not used as a guiding star, hence not shown in the star chart) is high in the sky before dawn, winds will be light and good for sailing. But when Maileu hangs low over the sea at dawn, and the star Sota comes up before sunrise, winds will be dangerously strong. The star Rangalieli in the east presages good weather. When the star Ul rises before dawn (this would be Tagal'ūlu of Fig. 16), it is a good time for a voyage toward the west."

2: Damm et al. --6-7 (1909) 1938 Woleaians
116, 132 Ifaluk

The island group has not been spared by typhoons; in fact five of them have vented their fury on it. Previously, violent wind and rain caused some damage. Trees were uprooted, but nobody died, although these storms were followed by famine. The typhoon of March [7] 27-28, 1907 devastated the island, and 35 natives perished (24 from Jŏr, 10 from Jiwăn on Falālăp, and one boy from Felādjĭk). According to the local reports, the wind first appeared from the NE, and it lashed the island group broadside, but as yet there was no flood tide. But when it turned SE the water roared over Falālăp and Felādjĭk, and carried everything away. In 1909 you could still see some of the havoc that it had wrought. Hellwig wrote in the Logbook of the Expedition: "The dry, white trunks of great trees, that were bereft of their branches, stood out among the underbrush, and even at a distance you could see the palm trunks lying in rows on the ground."

On the other hand the typhoon did some constructive work; it fused the sand island Măje with the large island, and thus increased the area suitable for building purposes.

2; Damm et al. --114 [2] (1909) 1938 Woleaians
116, 132 Aurupik

This island also suffered a great deal from the dreadful typhoon of March 1907, and you could still see traces of it in 1909. The natives told Hambruch, that the typhoon had carried away a part of the eastern end of the island. Sixty years before, a similar storm is supposed to have devastated the island.

For general information about the climate and temperature on the Carolines, compare Singer (1899, Globus, Vol. 76, page 41).

2: Damm et al. --198 (1909) 1938 Woleaians
132 Faraulep

Yoṅeläf

is regarded as a kind of demon. And since he brings the typhoon, he is greatly feared on the lower Caroline Islands.

[MR: From the Südsee-Handbuch, page 34]: The wind and weather are similar to conditions on Jap: from May to September calms and indefinite winds prevail, but mostly they are those of the southern quadrant; from December to May, on the other hand, the northeastern monsoon is dominant.*

*It would more accurately be called a trade wind instead of a monsoon, because the true monsoon season--such as it occurs in the Indian Ocean--is lacking.

In 1903 the northeastern monsoon blew from January until the middle of April; from then on until November eastern winds prevailed, but the air currents were irregular and southwestern winds were frequent. Between November and January the wind blew principally from southeast to northeast. Typhoons on the whole are rather rare, but the depopulation of the islands around the year 1845 is explained by just this type of natural catastrophe. The violent typhoon of March 1907 also wrought devastation on these islands. [3]

Rain falls during all months, but hitherto limited measurements have shown that 1,540 millimeters or 56% of the total are to be attributed to the five months from April to August. The driest month is February with no more than 52 millimeters of rainfall. January, February and March with 331 millimeters receive only 12% of the total.

4: Krämer--3 (1909) 1937 Woleaians
116, 132 Lamotrek

The Südsee-Handbuch on page 5 after Hans Meyer Das Deutsche Kolonialreich gives rainfall measurements for Lámutrik, lat. 7° 26' W, long. 146° 30' E.

Month	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
	144	52	135	294	236	342	327	341	153	264	208	244

Total: 2, 741 millimeters

Following these statistics is a treatment of the winds.

4: Krämer--33
116, 132

(1909) 1937

Woleaians
Lamotrek
Elato

On December 12, 1900 a light typhoon is said to have hit the [Lamotrek] islands. Southwestern winds in January are looked upon as bad omens. In 1907 the typhoon of Oleai did not hit the Lamotrek group quite as hard.

4: Krämer--185-186 (1909) 1937 Woleaians
116, 132, 175, 731 Woleai

Tagaulap. About fifteen to twenty years ago at the time of the southwestern monsoon a tidal wave tore away the entire southern end of the island of Tagaulap with all its houses, coconut palms and breadfruit trees but without the loss of human life. Today the tip of the island is completely covered by sand and only the bare skeletons of dead trees rise above the dry sand. [186]

During the typhoon at the end of March 1907 Raur was destroyed by a tidal wave. No more than two people escaped this catastrophe. The former island at the present time is a reef covered with a sandbank. During the typhoon, the government schooner "Ponape" happened to lie at anchor south of Flalap. When the winds were northeasterly to westnortheasterly she lost both her anchors and with the tidal wave that had destroyed Raur, she was carried southwest across the reefs and out to sea.

4: Krämer--256 (1909) 1937 Woleaians
116, 132 Woleai

The typhoon of Aurepik seems to have hit Oleai, too, in 1830.

6: Senfft--53
116, 132

(no date) 1905

Woleaians
Woleai

There are abundant rainfalls during the season when the southern winds are predominant, that is, from June to December. This also explains the fertility of the islands.

6: Senfft--53-54
116, 132

(no date) 1905

Woleaians
Lamotrek

There have been no typhoons on the island for decades. May to December is a period of calm or of constantly changing winds; for the most part, the winds [54] from the southeast, the south, and the southwest predominate at that time. From December to June there is a strong northeast monsoon. The average rainfall on Lamutrik is approximately 3,000 millimeters per year.

6: Senfft--54
116, 132, 165

(no date) 1905

Woleaians
Woleai

Oleai had been swept by this same typhoon, but the results were less unfortunate. There I learned, however, that the population had decreased by one-third during the last few years.

9: Senfft--13 (1903) 1904 Woleaians
116, 132 Lamotrek

Since the last heavy typhoon the island had been only troubled by some more or less violent winds. About the rainfall since 1901 an account had been made and sent to the Foreign Office.

11: Born--176 (1903) 1904 Woleaians
116, 132 Woleai

About 15 or 20 years ago, at the time of the southwest monsoon, a tidal wave swept away the entire southern tip of Tagaulap, together with all the houses, coconut and breadfruit trees on that section, although no lives were lost; this island is most exposed to the rough sea of the southwest winds. Today the tip of the island consists only of sand, and nothing is left but the bare branches...

14: Born et al--567-570 (1907) 1907 Woleaians -1 6
116, 132, 731 Woleai

Wednesday evening [MR: March 27, 1907] passed quietly with almost complete calm and beautiful moonlight. Early the next day several sharp thunderstorms passed over the islands from north and east, and a strong wind with rain squalls set in by fits and starts. The wind let up again and again after a short time, and then there was almost complete calm. From morning on a striking phenomenon was the ever stronger surf from the east and south, which had no relationship to the strength of the wind. Likewise, there appeared early in the morning numerous huge frigate birds, which hovered aimlessly back and forth over the island. I had not noticed these birds in Oleai before. In the usually quiet lagoon there was already a heavy sea at noon, rolling up on the sandy shore in mighty breakers. The first officer of the "Ponape" explained this phenomenon to me as the beginning of a spring-tide, which might be expected the next night (full moon). Towards one o'clock P.M. I went aboard the "Ponape" to consult with the captain about the weather. He told me that under the circumstances a departure that day was not to be considered, the barometer was falling sharply; there was the possibility of an approaching typhoon. He further declared that in such an event he would try to hold fast as long as possible in the lagoon. Finally, he asked me to stay on board because I would be safer than on land. However, considering the impossibility of bringing my bulky baggage on board now with the constantly heavier sea, I preferred to go ashore again.

In spite of the fact that astonishingly there was almost no wind, there was, [568] when I left the ship at about 2:30 P.M., a fearful sea, both on the outer reef and in the lagoon so that the "Ponape" had to change her anchoring place. Shortly after I left the ship a strong rain squall suddenly came blustering from the north-northeast, which struck the canoe I was in violently so that we almost sank. Summoning all their strength, the natives succeeded in holding the canoe and bringing it to land. Here I found my house already evacuated for during my absence powerful waves had come up over the 80 to 100 meter long dunes as far as the house. In the course of the next two and a half hours this whole dune, the eastern point of the island of Oleai, was washed away; there was now a wide passage between the islands of Oleai and Talian, and through this the waves coming over the outer reef from the northeast crashed wildly into the lagoon, where they met the equally heavy surf from the southwest so that the waves towered very high. At 5 o'clock, while I sat writing on the veranda, a heavy sea with slight wind again broke over the reef and, striking towards my house, it threw me several meters away through the splintered veranda railing. My left thigh was severely bruised by falling beams, which made walking very difficult for me and on the next day would have been almost disastrous. At 5:15 I sent a note to the captain of the "Ponape," in which I transmitted to him the advice of a Spaniard who was with me to move the anchorage of the "Ponape" near the village of Isang, under the protection of the northwestern point of Oleai. I thereupon received a note saying that the barometer was standing still and abating of the

wind was to be expected, but that on the other hand the surf would still increase. Shortly before 6 o'clock I had to abandon the already half demolished station; I moved back into the adjacent village of Leuleperik, where I took quarters in a recently finished finely built native house. Late in the evening the wind from the north-northeast began to grow still stronger so that branches of trees were already being broken off. From 1 A.M. on one heard through the whistling of the wind the constant snapping of branches like musketry fire and the crashing of huge falling trees like the thunder of cannon, above itall rose the thundering noise of the surf, but the houses stood firm through the whole night. Towards 5 o'clock we (the Spanish trader Villaçon and I) were awakened by the watch we had posted with the news that the waves were already striking in the village of Leuleperik and that there was already water around our lodging. Leuleperik is about 800 to 1,000 meters away from the northeast shore. The water rose so fast that we scarcely had time to give the most necessary instructions for saving the luggage. We hurried to the Japanese station, which is in the village of Jaur, at the widest part of the island, and in the middle of it. The way was already blocked by fallen coconut palms and other trees lying in all directions, in some places forming real barricades. In spite of the coconuts, branches and trees whistling down to the right and left of us, we reached the Japanese station without accident, and had there an open view of the lagoon to the south. The schooner "Ponape" was not to be seen. Glaring lightning flashed on the horizon in the west. The surf in the lagoon was already beating against the houses of the village. We

soon left the Japanese station and betook ourselves to the most westerly canoe house of the village of Jaur, where a large part of the inhabitants of the island had gathered. The people had completely lost their heads. Like birds in a cage unable to find their way out, they ran aimlessly back and forth, anxiously listening to the roar of the surf. No efforts to encourage or console them did any good. All believed that the sinking of the islands had come and that the old prophecy would now be fulfilled that Oleai would one day be washed away by the sea. When the sea began to come further and further inland from the lagoon, we had to abandon this place, too. The Japanese traders appeared and reported that a wave coming from the interior of the island had washed away their trading station in a moment. So we had to withdraw into the interior of the northwestern point of Ifang. That was our last recourse. If the sea reached this part of the island too we were lost. Here there stood a house on a little knoll in which a large crowd of screaming, weeping natives had taken refuge. Some women were singing death laments in their distress. When a man suddenly announced that the sea was now coming also from the northeast out of the bush, the confusion reached its climax. I climbed a broken down coconut palm and saw the waves, like white cats, leaping through the woods from the northeast. When I came down from the tree the water was up to my hips. We provided ourselves with planks of wood and strong [570] ropes and turned again to the lagoon side of the island. The water was fortunately rising slowly; the wind was weaker. Then we saw a mighty breadfruit tree which had been wrenched from the ground with all its

roots. We climbed up on these roots, which stood several meters high, and found ourselves relatively secure there. Scarcely had we found this place of refuge (it must have been about 9 in the morning) when the real typhoon set in from the east-southeast. It is impossible to describe the strength of this wind. It was as if a thousand express trains were racing close by our tree. The air was so full of rain and sea spray, mixed with sand, that is was impossible to see to a distance of even a few meters. Thus the storm raged uninterrupted until towards 3 in the afternoon, coming from east-southeast to southeast.

At this time it calmed a little. The sun even broke through, though veiled, for a few minutes, and it was now possible to orient ourselves. It turned out that we were quite close to the shore of the lagoon in the northwestern corner of the island. The water had fallen. Around us there stretched a wide desolate waste, the ground was covered meters high with fallen trees. Only now and then, where a blooming, delightful garden had been, did the bare stump of a breadfruit tree and some withered palms project. Far and wide there was no trace of human habitation. Only a few disordered heaps of ruins marked the places where the great canoe houses, filled with the pride of the natives, the artful high-sea canoes, fishing wier baskets and nets, had stood. There was no human being to be seen. When we approached the village of Jaur, we found the water there meter-high. Suddenly we saw two fantastic figures, youths, rubbed bright red all over their bodies, carrying a pig. We followed them and wading in water up to our hips we reached,

after difficult climbing stretches, the place in about the center of the island where the natives had already partly gathered again. It turned out that by good fortune none of the inhabitants of the island of Oleai had perished. A bivouac was quickly put up, huts constructed of bush work, and a fire lit. In this bivouac we spent the first night of pouring rain.

On Saturday, March 30, in the morning, the wind had let up considerably. We went to the shore and looked around. The sea was still wildly whirling and seething in the lagoon; there was no trace of the schooner "Ponape." A walk along the shore of the island showed us everywhere the same ghastly devastation. The islands of Paliau and Raur seemed to have suffered especially badly. At the place where the lovely island of Raur had been opposite Oleai, only a long, white sandbank with a few palms and tree stumps was to be seen. On the beach at Leuleperik we found the first victim of the catastrophe, the body of a boy about 5 years old....

14: Born et al--570 (1907) 1907 Woleaians
116, 132, 173 Woleai

As to the question of the cause of this horrible catastrophe [MR: typhoon, March 1907] I should like to impart some observations which I made after the typhoon, but without the intention of drawing conclusions from them. It seems to me that it is not out of the question that volcanic, undersea eruptions had something to do with it. During the typhoon at 10 in the morning earthquakes could be felt; many pumice stones were washed ashore, which competent people said were lava. The whole atoll seemed even to the natives to have lifted since the high water mark had receded considerably. A new island emerged between Falalis and Motogosu, where, to be sure, there had already been a reef. This island is called Met and is supposed to have been inhabited long ago in the dim past. The native legend relates that a tidal wave washed it away in those days. Between the islands of Paliau and Oleai there used to be only a small passage, which was almost dry at low tide. Now, after the typhoon, this passage is very considerably widened and deepened. The reef bank between these two islands was cracked like a marble slab thrown on the floor; great pieces were split out of it. The ground on the islands of Paliau and Raur also looked as if shattered. On the outer reef of Raur, where the tidal wave had broken over it, there were three longish piles of coral rubble like little lonely islands. The outer reef side of the same two islands, formerly grown with thick bush, was a flat surface strewn with coral gravel, smooth and even as a table, where it had been exposed to the tidal wave. The direction of the tidal wave was presumably from east-northeast to west-southwest; its height cannot be given with certainty.

14: Born et al--571
116, 132, 731

(1907) 1907

Woleaians
Woleai

The accounts of those saved from Raur and Paliau unanimously gave the following picture of the events on those islands: As early as the evening of March 28, experienced people concluded from the peculiar roar of the surf that a tidal wave was approaching. So all precautions were taken to save the women and children, and they were fastened with ropes in the branches of breadfruit trees. On March 29, towards 8 in the morning, after the water had risen a meter and a half high on the island during the night, a dark cloud appeared with a terrifying whistling noise over the tops of the highest breadfruit trees, thus over 40 meters high: the tidal wave. It broke like a gigantic jet of water in the middle of the islands and poured with a terrific flood into the lagoon. However, this first tidal wave did not tear away the tightly bound people; but directly after the first came a second and still higher wave, which swept away all trees, houses and people. The lagoon at this moment was a great whirling eddy, into which the trees full of men were torn. Those who did not drown were crushed by the trees in the surf on the reef ledges.

14: Born et al--573 (1907) 1907 Woleaians
116, 132, 731 Woleai

On April 11 in the evening the steamer [MR: "Germania"] anchored in the lagoon of Oleai. Dr. Born came aboard immediately.

Some of the islands which I [MR: district official Fritz] saw three months ago in the full splendor of their luxurious coconut groves, are wholly destroyed; only a few trees project from the heaps of fallen ones, standing, but without their tops; not a green leaf is to be seen.

Until June rainfall left much to be desired; besides the strong northeastern trade wind completely dried out the thin-layered soil and was very disadvantageous to the flora. In spite of the lack of rain and the prevailing strong winds a mosquito plague again proved most disagreeable during May and June.

The amounts of precipitation recorded at the three weather stations were as follows:

	Jap	Palau	Lamutrik
1904	2986.0 mm	--	--
1905	2917.3 mm	3218.6 mm	1961.10 mm.

LAMOTREK (West Carolines); Observer: Evan Lewis

1902	Rainfall in mm				Days with rain						
	6 am	6 pm	total	maxim 24 hrs.	in gen.	above 0.2 mm	above 1.0 mm	above 25.0 mm	storm	only sheet lightning	earth quake
January	-	-	-	-	-	-	-	-	-	-	-
February	-	-	-	-	-	-	-	-	-	-	-
March	-	-	-	-	-	-	-	-	-	-	-
April	-	-	-	-	-	-	-	-	-	-	-
May	-	-	-	-	-	-	-	-	-	-	-
June	281.7	185.8	467.5	75.9	18	18	18	6	0	3	0
July	228.4	205.9	434.3	63.9	21	21	21	5	1	1	0
August	293.7	101.4	395.1	90.6	18	18	18	5	1	0	0
September	55.9	66.0	121.9	32.0	10	10	10	1	0	0	1*)
October	55.3	67.5	122.8	30.8	6	6	6	3	0	0	0
November	**)	-	116.7	-	-	-	-	-	-	-	-
December	35.9	23.3	59.2	17.5	8	8	8	0	0	0	0
YEAR	-	-	-	-	-	-	-	-	-	-	-

*Sept. 22, 11:47 am, earthquake

**Observer absent from Nov. 1 to 17. During that period 85.0mm rainfall collected in the rain gauge.

LAMUTREK, WEST CAROLINES

Observer: Evan Lewis

1903	Rainfall in mm			Max in	No. of Days with Rain				
	6 AM	6 PM	Total	24 hrs.	in Gen'l	above 0.2mm	above 1.0mm	above 25.0mm	storms
January	61.7	45.5	107.2	34.3	8	8	8	1	--
February	13.5	6.5	20.0	10.0	3	3	3	0	--
March	6.0	0.0	6.0	3.5	2	2	2	0	--
April	88.0	56.0	144.0	46.3	9	9	9	2	--
May(19-31 missing)	--	--	283.0	--	--	--	--	--	(2)
June	75.0	162.2	237.2	38.5	18	18	18	2	1
July(1-9 missing)	--	--	391.4	--	--	--	--	--	(1)
August	81.0	194.5	275.5	78.2	10	10	10	5	3
September(26-30 missing)	(85.2)	(112.3)	(197.5)	(80.0)	(10)	(10)	(10)	(3)	--
October(1-15 missing)	--	--	209.8	--	--	--	--	--	1
November	218.7	141.6	360.3	104.0	13	13	13	4	3
December(12-20 missing)	--	--	461.6	--	--	--	--	--	(2)
YEAR	--	--	2693.5	--	--	--	--	--	--

26: Anonymous--206 (1903) 1904 Woleaians-2
116, 132 Lamotrek

[JJH: The observer found it necessary to be absent several times. On his return he always measured the amount of rainfall that had collected in the gauge during his absence. Thus the yearly total can be relied upon, with the exception of the slight amount lost by evaporation.]

The north-east trade wind blew steadily from Jan. to the middle of April. The winds were irregular from then until the beginning of November. Although during this latter period winds were observed coming from the eastern quadrant, southwest winds were also frequent. During November the southeast to northeast winds again won supremacy.

Storms almost without exception came from N, NE to SE.

27: Anonymous--232 (1906) 1907 Woleaians
116, 132 Lamotrek

[JJH: Following is additional information for 1905]:

LAMUTREK, West Carolines

	Rainfall in mm				No. of Days with Rain.			
	6am	6pm	total	Max. in 24 hours	in Genl	above 0.2mm	above 1.0mm	above 25.0mm
Nov. 1905	150	52	202	71	9	9	9	3
December	54	38	92	30	6	6	6	1
Year	---	---	1963	---	---	---	---	---

28: Spiro--1-2 (1947-48) 1949 Woleaians
116, 132, 805, 831 Ifalik

"There are two seasons in this area, that of the prevailing westerlies, and that of the prevailing easterlies. The latter is the season of the tradewinds, and enters about the middle of November. The natives largest unit of time is this climate season, which is called a rag. They recognize neither the solar nor the lunar year, but the rag is easily ascertained because of the abrupt change in the direction of the winds. The months in the rag are named, but are of little importance in the culture; most of the people, indeed, do not remember the names. The current month is the important month, and is referred to by the generic name for month, maram, which is also the name for moon. [2]

There is, of course, no conception of the week. The day is divided into fourteen parts, all of which are named, and indicated by the movement of the sun. The night, too, is divided into fourteen parts, indicated by the position of the stars, of which the natives named and identified forty for me. But these divisions are almost never used. The four divisions, morning, noon, afternoon, and night are usually sufficient for their needs."

28: Spiro--1 [4]
116, 132

(1947-48) 1949

Woleaians
Ifalik

"Data on climate in Ifaluk are hard to obtain. The few instruments we had with us became casualities of the humidity. But the figures on temperature we did obtain seem to corroborate the official temperature recorded for the entire area by the Germans and Japanese. These give a mean temperature of 80' F. with variation of no more than four degrees. (2)

The average relative humidity for the Western Carolines is about 81 per cent. Despite this relatively high humidity, the climate is not uncomfortable; on the contrary, I found it quite pleasant. This is probably due to the prevailing winds and the trees which shade the islands and protect them from the glaring sun.

Rainfall is relatively heavy. The figures vary, but an average of 100 inches is a safe figure."

"2. Civil Affairs Handbook, West Caroline Islands, 1944."

30: Wendland--72
116, 132

(1904) 1905

Woleaians
Lamotrek

LAMUTREK. WEST CAROLINES
Observer: Evan Lewis

1904	Rainfall in mm				No. of days with Rain			
	6 am	6 pm	total	Max. in 24 hrs.	in Genl.	above 0.2mm	above 1.0mm	above 25.0mm
January	133.2	199.3	332.5	49.2	16	16	16	5
February	15.8	4.2	20.0	12.5	3	3	3	0
March	174.7	106.3	281.0	52.8	13	13	13	5
April	--	--	569.9	--	--	--	--	--
May	--	--	--	--	--	--	--	--
June	--	--	--	--	--	--	--	--
July	--	--	--	--	--	--	--	--
August	--	--	--	--	--	--	--	--
September	--	--	--	--	--	--	--	--
October	113.3	106.4	219.7	55.5	10	10	10	3
November	--	--	175.3	--	--	--	--	--
December	68.0	40.0	108.0	30.0	6	6	6	2

41: Bates & Abbott N-5 (1953) 1958
OR21 Woleai OR21
Ifaluk

CHAPTER II

MOSTLY ABOUT PEOPLE

THURSDAY, the first day after the NETTLE left, was overcast, with occasional drizzling rains. This was probably just as well because it cut down on the temptation to wander; so we could concentrate on the organization of camp at the Fan Nap.

The Fan Nap—the "Men's House"—was a large structure, some forty feet long and twenty wide, with a high thatched roof that sloped steeply to within a couple of feet of the ground on the sides. The ends were closed with matting down to within four feet of the ground, which meant that any adult must crouch on entering or leaving. The main cross-beams inside were higher, but still low enough to be a constant hazard. I never did learn to use the proper inside-of-house crouch, and kept battering my head all summer. Ted and Don were more alert—or at least better at dodging.

The front part of the Fan Nap, nearest the lagoon, was used for sleeping quarters. Ted and Don had their cots at the sides, under the stringers—beams that had been hewn out of huge breadfruit logs. The logs looked precariously balanced on the heavy coral blocks that served as the corner posts of the house. Collapse of the house would have caused the occupants of the cots to be instantly crushed. The great beams, so close above, were thus at first something of a mental hazard. But they had withstood the gales of many years and were clearly solidly placed—and they were very convenient for hanging mosquito nets.

Tables and boxes were arranged in the central area to make working space. The equipment included carpenter's tools, and with these some

41: Bates & Abbott N-5 (1953) 1958
OR21 Woleai OR21
Ifaluk

of the wooden packing boxes were converted into sets of shelves. The cases of food were piled along the sides in the back part of the house, which became the kitchen area, cozily walled with cartons of sliced peaches and spam.

There was an altar in the back part of the Fan Nap that was a constant mental hazard because we did not want to offend the local people by desecrating this shrine with profane objects. The altar was a ramshackle affair, contrasting strongly with the usual Ifalukian workmanship, and this may have indicated that it was not taken very seriously; but we wanted to run no risk of giving offense. There was a large chest there, too, which we judged to be a sort of depository for the appurtenances of government. Among other things, the American flag was stored in the chest, to be hauled out and attached to a pole on the lagoon shore when a ship was sighted.

There was another sacred touch to the Fan Nap—a phallus attached to the main front center post and pointing out across the lagoon. The phallus, which pointed westward toward Woleai, the nearest neighboring atoll, commemorated an event of Ifaluk legend—or history. The story was one of violence and conquest and seemed curiously anomalous in the Ifalukian folklore, contrasting as it did with the present completely non-aggressive and peaceful character of the people. Ted thought that it might reflect memories of an actual conquest by the people of Ifaluk of earlier inhabitants of the neighboring atolls. Maur, the main character in the legend, was certainly the "culture hero" of the people of the island.

The phallus did not seem to be the object of any special veneration or cult—it was just there. Once, later in the summer, when we were trying to explain the money system of the United States, we were questioned about the portrait heads on the coins. Don explained Washington and Lincoln as long-dead "chiefs" thus commemorated.

Yani got the idea at once. "Ifaluk have picture of dead chief, too," he said, grinning, as he pointed toward the phallus of Maur on the Fan Nap.

The weather continued to interfere with the starting of field work. Friday it rained almost continuously all day—and of course the rain

41: Bates & Abbott N-5 (1953) 1958
OR21 Woleai OR21
Ifaluk

gauge wasn't unpacked and set up yet. A stiff wind came up in the afternoon and kept increasing in force. Late in the afternoon Tom came by with Maroligar, the number two chief. Tom pointed out across the lagoon to the west and said, "Maybe typhoon." Maroligar seemed somewhat worried as well. What the two wanted, apparently, was a weather prediction—from us newcomers to the tropical Pacific! It showed a touching and completely misplaced faith in the famous "American know-how." I was in charge of the meteorology department and I peered at the thermometer (79°F at 5:45 P.M.) and barometer (1005 millibars) but I was unable to draw any deductions from these helpful facts.

In the evening, quite a number of men gathered in back of the Fan Nap, clearly worried about the weather. Maroligar borrowed one of the big Navy battery flashlamps and learned how to turn it on and off. He wanted some sort of a light so that if the weather worsened during the night, he could round everyone up and lead them to some safer spot, perhaps the boulder ridge on the windward side of the island—the highest spot, some fifteen feet above sea level. The houses were mostly along the lagoon shore and Ted remembered that waves had reached to the Fan Nap on his previous stay, with a wind of considerably less than typhoon violence. Don and I read what there was on typhoons in the books we had brought along, and I tried to remember what I could about the characteristics of Caribbean hurricanes—but nothing helpful came out of this.

The wind settled down to a steady blow, and I comforted myself, going to sleep, by thinking that hurricanes struck suddenly, after a period of still, oppressive heat, so that this slow build-up of wind could hardly be dangerous—misinformation, but none-the-less comforting.

The next day, Saturday, started out cold, with a completely overcast sky. But the rain had let up, so we sallied forth to begin work. Our first project was to make a census of the people on the island. Ted had made a census on his 1948 visit and he wanted to get a record of the changes. For Don and me, the census would be an essential basis for our studies of "human ecology." Further, if we made the census our first item of business, it would give us an opportunity to meet all of the people on the island.

41: Bates & Abbott N-5 (1953) 1958
OR21 Woleai OR21
Ifaluk

were tucked in with some old clothes, and seemed contented enough.

In general, the people had fine physiques, and seemed very healthy. There was one woman who looked like an albino with freckles, and another old woman had her nose and upper lip completely eroded away, probably from yaws. Yaws was once prevalent in all of these islands, but it yields quickly to penicillin injections and during the post-war period of American control, the Navy medical service instituted an effective campaign of yaws control.

After the first three households had been completed, the party waded back across the shallow pass to "home" at the Fan Nap for lunch. The weather kept us in for the rest of the day. The sky had been completely overcast all morning, with occasional drizzling rains, but without strong wind. In the afternoon the wind became steadily stronger. It started to tear coconut fronds, even green ones, from the trees, and the coconuts themselves were being blown off in large numbers. Don noticed one coconut fall at an angle of about thirty degrees from the vertical in the wind, and he figured that the wind had the force of eight or nine on the Beaufort scale—gale force.

About four o'clock Maroligar and some other men came around to the Fan Nap and lashed poles and boards across the open western end, where it faced the lagoon. A tent that had been unpacked but not set up was dragged over and lashed to the poles, nicely cutting out the wind and rain and making the interior fairly snug and comfortable. But the noise of the wind and waves outside kept increasing. A typewriter could not be heard four feet away, even in this snug interior. (Ted was typing up his notes from the morning, impervious to typhoons.)

We kept worried eyes on the barometer and on the wildly swaying palms. Men everywhere were out battening down their house walls with matting, and running great ropes from the gables, making them fast to the bases of nearby palms. Maroligar, hovering about the Fan Nap with obvious concern about the guests on the island, made it clear that if things got much worse we should move in to one of the houses farther from the shore.

Then suddenly, about five o'clock, the worryings and speculations were disrupted by a wave of excitement. An airplane had been

41: Bates & Abbott N-5 (1953) 1958
OR21 Woleai OR21
Ifaluk
Ulithi OR20

obliterated completely. The ferocious wind scooped up the sea and hurled it over the island, ruining the fresh water in our rain catchments. The waves came up into the canoe houses and crumpled some of them. All canoes had previously been dragged inland into the villages and tied down between the houses. One of the women's club houses, which also served as maternity ward and hospital, began swaying under the impact of the storm. The women and children were removed to safety just before it disappeared in a spray of flying splinters. The waves piled up and crashed on the beach rolling water a hundred yards inland. The islands are only ten feet above sea level and the ocean threatened to inundate the land. All the coconuts and most of the fronds had been stripped from the trees. For nine months afterwards the people were on short rations and no copra could be produced."

The same trade ship brought news that another storm, about a month before, had hit Ulithi when a fleet of fishing canoes was out on the reef. Three canoes, with seven men, disappeared. The lost men included Tony's uncle, brother and nephew, and his niece lost her husband.

Ifaluk was too close to the equator to be often in the path of typhoons; it was in the area where these storms generally build up, gaining hurricane force as they move north. The island had not been struck by a major typhoon since 1907, but the storm of that year was a fearful one, and its mark was still on the island. From the lagoon, a few coconut palms stood out, much taller than the others; they were the survivors of the 1907 disaster. Great blocks of coral tossed up on the reef before Falalap were testimony enough to the unbelievable force of the sea.

The wind continued, but it could be ignored now that it held no threat of increased violence, and in the evening Don and I started seriously on our project of learning something about the language of Ifaluk. We had asked one of the young men, Yaniseman, to help with this, and he turned up with his good friend Tachiwelimeng.

This was the beginning of a close friendship and constant collaboration. Yaniseman was one of three young men from the island who had been sent to Yap for several months by the government of the Trust Territory to learn English and, on return, to serve as teachers for the island. The English that they could learn in this time was rudimentary,